

Results

RESULTS

A- Results of Clinical Study

The results of the clinical study were as follows:

Group [I] (Seropositive group) Table (1):

There were 22 females (88 %) and 3 males (12 %), their ages ranged between 24 and 60 years with a mean of 42.4 years. The disease duration ranged between 1½ and 22 years with a mean duration of 8.5 years (S.D. \pm 6.9). As regards the duration of morning stiffness, it ranged between 0 and 180 minutes with a mean of 38 minutes (S.D. \pm 44.7). The functional capacity according to Steinbroker et al. (1949) classification, was grade I in 9 patients, grade II in 10 patients and grade III in 6 patients. On calculating the articular index for the whole body according to the modified Ritchie articular index, it ranged between 5 and 67 with a mean of 31 (S.D. \pm 15.2). The articular index for the hands ranged between 0 and 20 with a mean of 4.9 (S.D. \pm 2.5). The grip strength in either hand ranged between 10 and 200 mmHg with an average of 56.7 mmHg (S.D. \pm 39.8) in the right hand and 53.1 (S.D. \pm 42) in the left hand.

Group [II] (Seronegative group) Table (2):

There were 21 females (84 %) and 4 males (16 %), their ages ranged between 28 and 60 years with a mean of 39.3 years. The disease duration ranged between 1½

and 20 years with a mean of 8 years (S.D. \pm 6.2). As regards the duration of morning stiffness, it ranged between 0 and 180 minutes with a mean of 41.2 minutes (S.D. \pm 45.5). The functional capacity according to Steinbroker et al. (1949), classification was grade I in 6 patients, grade II in 16 patients and grade III in 3 patients. On calculating the articular index for the whole body according to modified Ritchie articular index, it ranged between 5 and 54 with a mean value of 24.4 (S.D. \pm 14.3). The articular index for the hands ranged between 2 and 17 with a mean value of 4.4 (S.D. \pm 2.5). The grip strength of the right hand ranged between 10 and 220 mmHg with an average of 65.2 mmHg (S.D. \pm 51.3), while in the left hand it ranged between 10 and 170 mmHg with an average of 66.4 mmHg (S.D. 43.5).

B- Results of Laboratory Study

In the first hour, the erythrocyte sedimentation rate ranged between 13 and 134 mm with an average value of 57.6 mm (S.D. \pm 28) in the seropositive group (Table 3). It ranged between 5 and 130 mm with an average value of 42.7 mm (S.D. 33.7) in the seronegative group (Table 4).

C- Results of Radiological Study

Radiographs taken for both hands of all patients in 2 different projections (postero-anterior and

Norgaard's) were studied for different radiological features.

By comparing the mean radiological grading of each joint of the seropositive group with each other and with the corresponding joint of the seronegative group (Table 7) we found that the mid-carpal joints in the 2 groups were the joints most affected, while the distal interphalangeal joints of the 2 groups were the joints least affected.

There was no statistical significance between the mean radiological grading of each of the wrist, mid-carpal and distal interphalangeal joints of the 2 groups ($P>0.05$), while the mean radiological grading of each of metacarpophalangeal and proximal interphalangeal joints of the seropositive group were significantly higher ($P<0.001$) than those of seronegative group (Fig. 5).

There was no statistical significance between the mean radiological grading of different studied joints in the right and left hands in either group ($P>0.05$) (Table 8).

The number of erosions in each group was calculated (Table 9).

* There were 117 erosions in the seropositive group distributed as follows: 7 erosions in wrists, 21 erosions

in mid-carpals, 45 erosions in metacarpophalangeal joints, 38 erosions in proximal interphalangeal joints, and 6 erosions in distal interphalangeal joints.

* In the seronegative group, there were 93 erosions distributed as follows: 5 erosions in wrists, 54 erosions in mid-carpals, 17 erosions in metacarpophalangeal joints, 13 erosions in proximal interphalangeal joints, and 4 erosions in distal interphalangeal joints.

So, the greatest number of erosions in the seropositive group was located in the metacarpophalangeal joints while the mid-carpal joints of the seronegative group were the site of the greatest number of erosions (Fig. 6).

In both groups, the distal interphalangeal joints had the least number of erosions.

By comparing the mean number of erosions in each studies joint in seropositive group with those in seronegative group (Table 10), we found that the metacarpophalangeal and the proximal interphalangeal joints of the seropositive group were highly significantly affected than the corresponding joints of the seronegative group while the mid-carpal joints of the seronegative group were highly significantly affected than those of the seropositive group (Fig. 7).

In our seropositive group, 12 patients (48 %) had erosions in metacarpophalangeal joints, 11 patients

(44 %) had erosions in proximal interphalangeal joints, 7 patients (28 %) had erosions in mid-carpal joints, 3 patients (12 %) had erosions in wrists and 3 patients (12 %) had erosions in distal interphalangeal joints.

In the seronegative group, 13 patients (42 %) had mid-carpal joints erosions, 9 patients (36 %) had metacarpophalangeal joints erosions, 5 patients (20 %) had proximal interphalangeal joints erosions, 3 patients (12 %) had wrists erosions and 2 patients (8 %) had distal interphalangeal joints erosions (Table 11) (Fig. 8).

By comparying the right and left hands we found that there was no statistical significance between the right and left hand affection by erosions either in the seropositive group or in the seronegative group ($P>0.05$) (Table 12).

As regards the deformities, there were 15 seropositive patients (60 %) having deformities in the form of: ulnar deviation of fingers (14 %), ulnar subluxation (32 %), swan-neck (12 %), boutonniere (8 %), and z-thumb (8 %). Those deformities were bilateral, symmetrical in 14 patients, while only one patient had unilateral ulnar deviation of fingers. There were 2 seronegative patients (8 %) having bilateral, symmetrical deformities in the form of ulnar subluxation.

Table (1) Results of clinical data of seropositive group.

Case No.	Age (years)	Sex	Disease Duration (years)	M.S. (min.)	F.C.	A.I. (Total)	H.A.I.	Grip Strength (mmHg)	
								Right	Left
1	27	F	7	30	II	43	14	20	26
2	60	F	8	5	II	32	10	40	25
3	50	F	5	15	II	35	17	20	10
4	32	F	10	60	III	36	8	100	110
5	47	F	16	60	III	45	10	45	38
6	42	F	22	0	I	14	3	90	90
7	36	F	4	45	III	34	12	50	50
8	24	F	4	60	I	12	10	75	63
9	67	F	7	20	II	35	12	40	25
10	24	m	7	0	I	6	3	200	200
11	42	F	1.5	10	I	17	5	100	105
12	46	m	18	60	I	5	0	80	70
13	37	F	7	0	II	31	8	40	45
14	38	F	6	0	I	17	4	90	80
15	60	F	3	90	II	28	12	10	10
16	55	F	15	90	II	30	8	40	40
17	30	F	1.5	30	III	67	19	30	40
18	50	F	1.5	15	I	46	10	60	40
19	45	F	20	0	I	26	6	40	30
20	25	F	5	0	II	29	12	18	20

Table (1) [Continue]

Case No.	Age (years)	Sex	Disease Duration (years)	M.S. (min.)	F.C.	A.I. (Total)	H.A.I.	Grip Strength (mmHg)	
								Right	Left
21	35	F	1.5	30	II	29	11	80	90
22	47	F	25	30	I	34	12	50	50
23	32	F	4	180	III	55	20	30	20
24	48	F	10	120	III	16	5	30	20
25	60	m	4	0	II	52	14	40	30
Mean	42.2		8.5	38		31	4.9	56.7	53.1
S.D.	<u>+12.3</u>		<u>+6.9</u>	<u>+44.7</u>		<u>+15.2</u>	<u>+2.5</u>	<u>+39.8</u>	<u>+42</u>

M.S. = Morning stiffness

F.S. = Functional capacity

A.I. = Articular index

H.A.I.=Hands articular index

S.D. = Standard deviation

m = Male

F = Female

Table (2) Results of clinical data of seronegative group.

Case No.	Age (years)	Sex	Disease Duration (years)	M.S. (min.)	F.C.	A.I. (Total)	H.A.I.	Grip Strength (mmHg)	
								Right	Left
1	28	F	3	60	II	14	8	50	100
2	35	F	4	60	III	42	16	15	25
3	45	F	15	15	II	27	12	60	65
4	48	F	2	15	I	5	3	80	100
5	50	F	6	5	I	14	2	90	80
6	50	F	20	5	I	22	11	50	60
7	55	F	20	90	II	48	14	40	35
8	30	F	10	180	II	31	14	35	40
9	32	m	20	15	III	12	5	80	60
10	43	F	6	30	II	49	17	10	10
11	27	F	2	10	I	54	14	50	50
12	49	m	6	80	II	7	3	120	135
13	39	F	1.5	0	I	20	6	85	80
14	35	F	17	15	II	30	6	20	40
15	60	F	3	5	II	15	6	40	35
16	40	F	3	15	II	16	8	30	50
17	40	F	1.5	120	II	25	9	40	30
18	42	F	10	0	I	9	2	130	120
19	37	F	9	0	III	19	12	30	20
20	30	m	10	120	II	15	4	220	170

Table (2) [Continue]

Case No.	Age (years)	Sex	Disease Duration (years)	M.S. (min.)	F.C.	A.I. (Total)	H.A.I.	Grip Strength (mmHg)	
								Right	Left
21	36	F	10	30	II	27	6	70	60
22	30	F	2.5	60	II	32	14	45	35
23	28	F	3	60	II	14	8	50	100
24	43	F	6	30	II	49	17	10	10
25	30	m	10	60	II	15	4	180	150
Mean	39.3		8	41.2		24.4	4.4	65.2	66.4
S.D.	+9.1		+6.2	+45.5		+14.3	+2.5	+51.3	+43.5

M.S. = Morning stiffness

F.S. = Functional capacity

A.I. = Articular index

H.A.I.=Hands articular index

S.D. = Standard deviation

m = Male

F = Female

Table (3) Results of laboratory investigations of seropositive group.

No.	Hb.(gm%)	RBCs	WBCs	ESR (mm/hr) in the 1 st hour
1	12	4.200	7.000	40
2	12.5	4.650	4.500	42
3	12.6	4.620	4.000	87
4	13.5	4.500	7.000	15
5	10.5	4.300	5.700	80
6	15.5	5.580	4.600	25
7	12	3.910	8.200	85
8	10.5	3.680	4.300	64
9	12	4.630	6.500	65
10	14.5	4.840	6.000	13
11	11	4.400	7.200	45
12	12	3.800	8.850	59
13	10.5	3.640	6.500	70
14	13	4.300	5.200	35
15	10.1	3.460	6.200	55
16	11.7	4.800	11.000	56
17	10.5	4.300	5.800	79
18	12.6	3.820	4.700	80
19	10.2	3.470	6.400	50
20	12	3.900	5.800	40
21	11.7	4.400	7.900	27

Table (3) [Continue]

No.	Hb(gm%)	RBCs	WBCs	ESR (mm/hr) in the <u>1st</u> hour
22	12.9	4.000	5.000	28
23	10.1	3.450	4.200	81
24	9.8	4.230	6.340	134
25	11	4.430	12.400	86
				57.6 <u>±</u> 28

Hb = Haemoglobin

RBC's = Red blood corpuscles

WBC's = White blood corpuscles

ESR = Erythrocyte sedimentation rate

Table (4) Results of laboratory investigations of seronegative group.

No.	Hb (gm%)	RBC's	WBC's	ESR (mm/hr) in the <u>1st</u> hour
1	10.6	4.330	4.100	15
2	10.1	3.900	5.200	65
3	10.8	4.500	6.100	5
4	13	4.750	7.000	60
5	10.5	4.300	5.700	130
6	12	4.600	7.000	18
7	12.6	3.800	4.800	80
8	12.7	3.750	9.000	40
9	13	4.720	6.500	12
10	12.5	4.300	5.700	16
11	11.5	4.400	7.500	72
12	11	4.400	7.000	55
13	10.6	4.300	5.200	32
14	11.2	4.140	6.400	22
15	12	4.600	8.000	31
16	10.7	4.300	9.300	60
17	12.5	3.640	5.600	25
18	12.9	4.520	8.300	15
19	9.9	3.600	5.000	60
20	14	4.830	13.000	26
21	12.4	3.900	6.000	41

Table (4) [Continue]

No.	Hb gm%	RBC's	WBC's	ESR (mm/hr) in the <u>1st</u> hour
22	10.5	4,300	5.700	130
23	10.6	4,330	4.100	15
24	12.5	4,300	5.700	16
25	14	4,850	13.000	26
				42.7 + 33.7

Hb = Haemoglobin

RBC's = Red blood corpuscles

WBC's = White blood corpuscles

ESR = Erythrocyte sedimentation rate

Table (5) Results of radiological grading of joints in the right and left hands of the seropositive group.

	WRIST		MID-CARPAL		MCP		PIP		DIP	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
1	1	1	3	2	1.2	1.2	1.3	1.5	0.6	1
2	0	0	2	2	2.4	1.6	1.3	1.3	0.2	0.4
3	1	1	3	3	1.6	1.4	1.8	1.3	0.8	0.6
4	1	2	3	3	1.6	2	1.8	2	1.2	1
5	1	4	4	4	3	2.4	3.3	2.8	2	1.4
6	2	4	3	3	2	1.2	2	1	0.4	0.4
7	1	1	3	3	1.6	1	1.3	1.5	1	1.2
8	2	1	3	3	1	1	1	1	0.4	1
9	2	2	4	3	1.2	1	2.5	2.3	0.6	0.6
10	4	3	4	4	1.4	1.2	4	4	1	0.4
11	1	1	0	0	1	0.8	1	0.5	0	0
12	2	2	2	2	3.6	3.6	1.5	2.3	1.4	0
13	2	2	4	4	1.2	1	2.5	2.3	0.6	0.6
14	0	0	0	0	0	0	0	0	0	0
15	1	1	0	0	1.6	1.2	1.3	1.8	0	0
16	4	4	4	4	3	3.2	2.5	3	2.2	2.2
17	0	0	0	0	1	1	1	1	0.4	0.6
18	1	1	1	1	1	1	1	1	0.4	1
19	1	1	3	3	1.6	1.6	0.8	0.5	0.4	0.6
20	1	1	4	4	1.4	1	1.8	2.5	1	1
21	1	1	1	1	1.8	1.4	2.5	2.5	0.6	0.8

Table (5) [Continue]

	WRIST		MID-CARPAL		MCP		PIP		DIP	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
22	4	4	4	4	1	1.4	1.8	3	1.2	0.8
23	3	2	3	3	1.6	1.2	2.8	2.5	0.8	1
24	1	1	1	1	1	1	1	1	1	1
25	1	1	3	3	1	1.4	1.3	1	1	1
Mean	1.5	1.6	2.5	2.4	1.6	1.4	1.7	1.7	0.7	0.7
S.D.	<u>+1.2</u>	<u>+1.3</u>	<u>+1.4</u>	<u>+1.4</u>	<u>+0.8</u>	<u>+0.7</u>	<u>+0.9</u>	<u>+1</u>	<u>+0.6</u>	<u>+0.5</u>

Table (6) Results of radiological grading of joints in the right and left hands of the seronegative group.

[illegible]

Table (6) [Continue]

	WRIST		MID-CARPAL		MCP		PIP		DIP	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
22	4	4	4	4	1.4	1.8	2	2.3	1	1
23	1	1	3	3	1	1	0.5	1	0	0
24	4	4	4	4	1	1	1	1	1	0.8
25	4	3	3	3	2.2	1.6	1.5	1.5	0.8	1
Mean	1.7	1.6	2.2	2.1	1.1	1	1.1	1.2	0.8	0.8
S.D.	<u>+1.5</u>	<u>+1.3</u>	<u>+1.5</u>	<u>+1.5</u>	<u>+0.5</u>	<u>+0.4</u>	<u>+0.5</u>	<u>+0.4</u>	<u>+0.4</u>	<u>+0.4</u>

Table (7) Statistical analysis of radiological grading of joints of both seropositive and seronegative groups.

	Seropositive		Seronegative		t	P
	Mean	S.D.	Mean	S.D.		
Wrist	1.58	± 1.2	1.62	± 1.4	0.15	> 0.05 Non significant
Mid-carpal	2.44	± 1.42	2.14	± 1.47	1.03	> 0.05 Non significant
MCP	1.47	± 0.76	1.08	± 0.44	3.25	< 0.001 Highly significant
PIP	1.73	± 0.91	1.15	± 0.45	4.14	< 0.001 Highly significant
DIP	0.76	± 0.52	0.76	± 0.39	0	Non significant

Table (8) Showing mean grading of joints in the right and left hands in both seropositive and seronegative groups.

		WRIST	MID-CARPAL	MCP	PIP	DIP	t	P
		Mean S.D.	Mean S.D.	Mean S.D.	Mean S.D.	Mean S.D.		
Seropositive Group	Right hand	1.5 \pm 1.2	2.5 \pm 1.4	1.6 \pm 0.8	1.7 \pm 0.9	0.7 \pm 0.6	0.36	>0.05 non significant
	Left hand	1.6 \pm 1.3	2.4 \pm 1.4	1.4 \pm 0.7	1.7 \pm 1.0	0.7 \pm 0.5		
Seronegative Group	Right hand	1.7 \pm 1.5	2.2 \pm 1.5	1.1 \pm 0.5	1.1 \pm 0.5	0.8 \pm 0.4	0.44	>0.05 non significant
	Left hand	1.6 \pm 1.3	2.1 \pm 1.5	1 \pm 0.4	1.2 \pm 0.4	0.8 \pm 0.4		

Table (9) Showing number and percentage of erosions in different joints of both seropositive and seronegative groups.

	Seropositive Group		Seronegative Group	
	Number of Erosions	%	Number of Erosions	%
Wrist	7	6 %	5	5.4%
Mid-carpal	21	17.9%	54	58.0%
MCP	45	38.5%	17	18.3%
PIP	38	32.5%	13	14.0%
DIP	6	5.1%	4	4.3%
Total	117	100%	93	100%

Table (10) Showing the mean number of erosions in different joints in both seropositive and seronegative groups.

	Seropositive	Seronegative	t	P
Wrist	0.14 \pm 0.5	0.1 \pm 0.3	0.5	> 0.05 Non significant
Mid-carpal	0.42 \pm 0.95	1.18 \pm 1.49	3.04	< 0.001 Highly significant
MCP	0.9 \pm 1.33	0.34 \pm 0.63	2.67	< 0.001 Highly significant
PIP	0.76 \pm 1.44	0.26 \pm 0.56	2.27	< 0.001 Highly significant
DIP	0.12 \pm 0.39	0.08 \pm 0.34	0.57	> 0.05 Non significant

Table (11) Showing number of patients having erosions in different joints in both seropositive and seronegative groups.

	Seropositive Group		Seronegative Group	
	No. of Patients	%	No. of Patients	%
Wrist	3	12%	3	12%
Mid-carpal	7	28%	13	42%
MCP	12	48%	9	36%
PIP	11	44%	5	20%
DIP	3	12%	2	8%

Table (12) Showing number and distribution of erosions in the right and left hands of both seropositive and seronegative groups.

	Seropositive Group		Seronegative Group	
	Right Hand	Left Hand	Right Hand	Left Hand
Wrist	4	3	4	1
Mid-carpal	9	12	29	25
MCP	25	20	7	10
PIP	20	18	5	8
DIP	2	4	3	1
t	0.19		0.18	
P	> 0.05		> 0.05	
	non significant		non significant	

Table (13) Showing types and number of deformities in both seropositive and seronegative groups.

	Seropositive Group		Seronegative Group	
	No.	%	No.	%
Ulnar deviation of fingers	7	14%	-	
Ulnar subluxation	16	32%	4	8%
Swan-neck	6	12%	-	
Boutonniere	4	8%	-	
Z-thumb	4	8%	-	

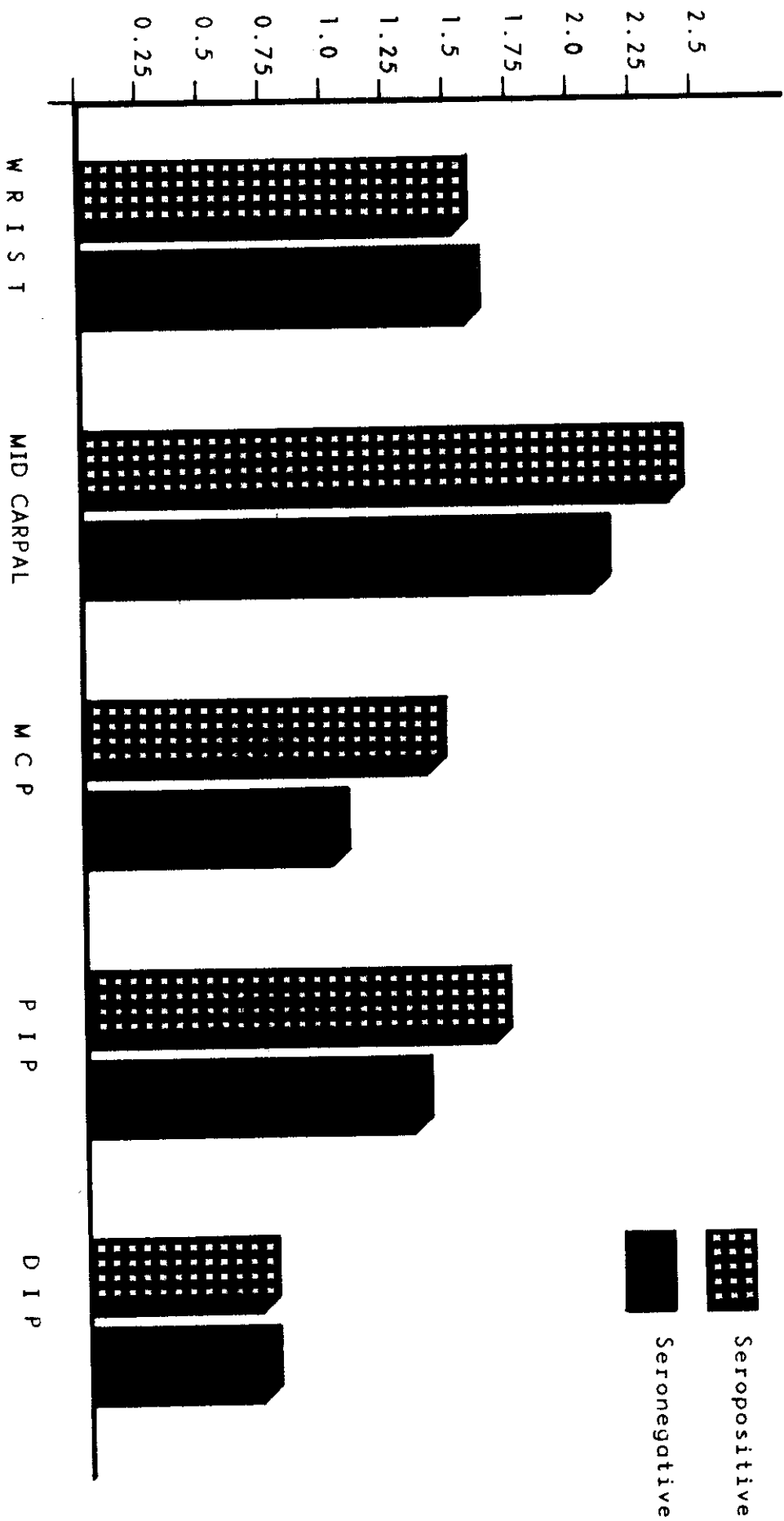


Fig. (5) Mean radiological grading of joints of seropositive and seronegative groups.

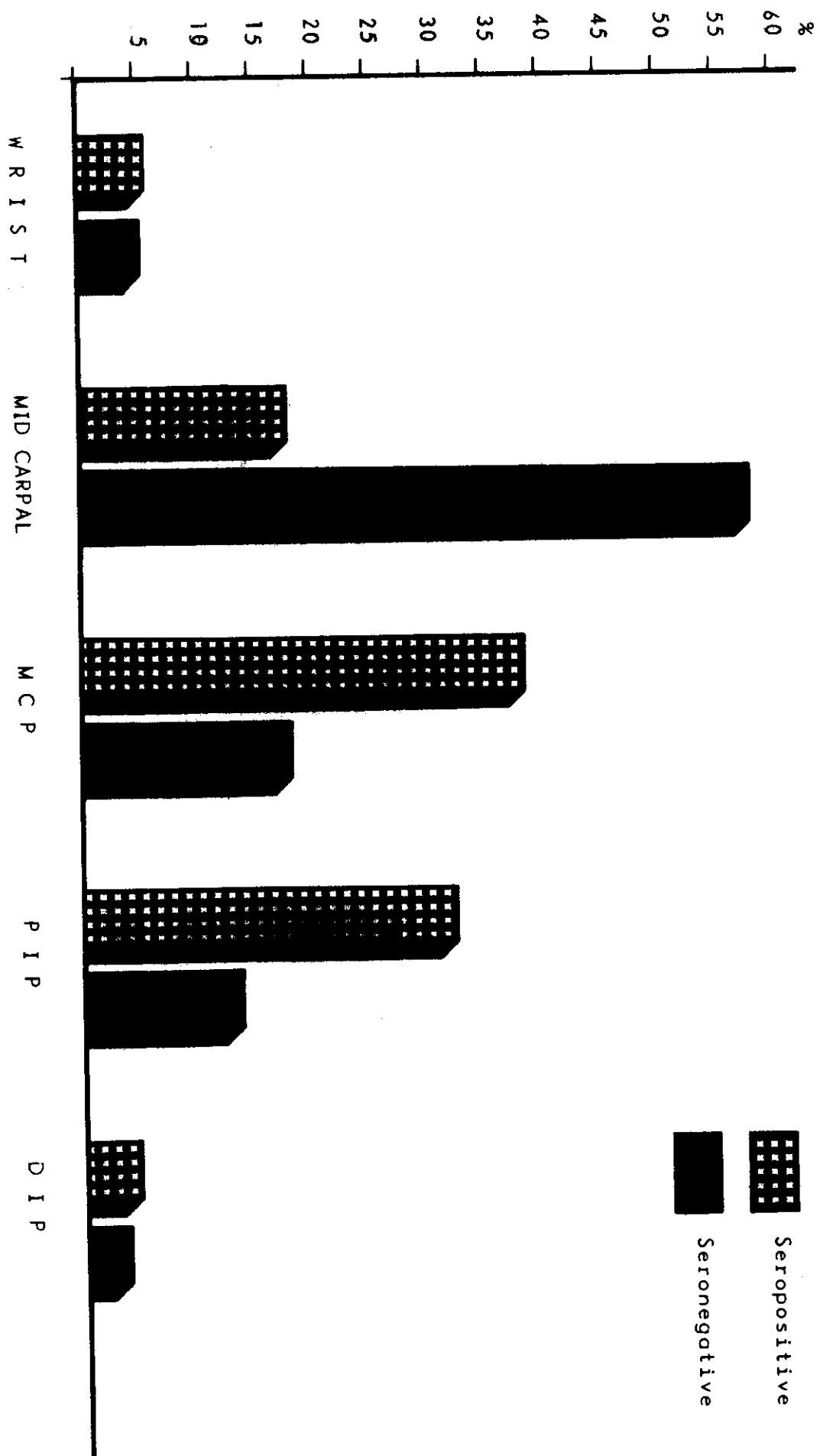


Fig. (6) Distribution of erosions in joints of both seropositive and seronegative groups.

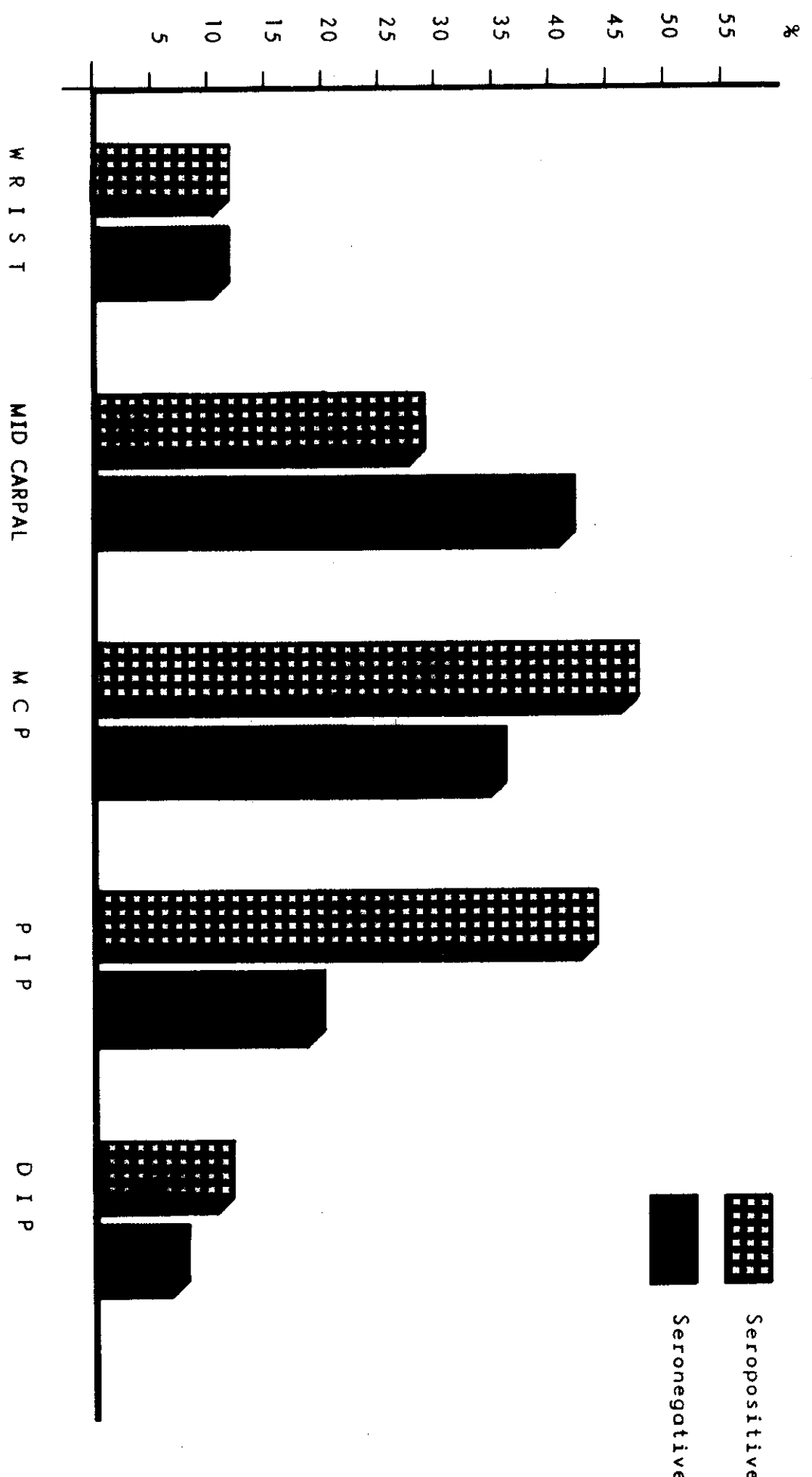


Fig. (8) Number of patients having erosions in different joints in both seropositive and seronegative groups.



Fig. (9) Radiological grading according to Steinbroker.

Grade [I] Osteoporosis, no erosions

"PIP of little finger of right hand".

Grade [II] osteoporosis, slight cartilage or subchondral bone destruction

"PIP of index finger of right hand".

Grade [III] osteoporosis, cartilage and bone destruction

"PIP of middle finger of right hand".

Grade [IV] bony ankylosis

"Mid-carpal joints of both hands".

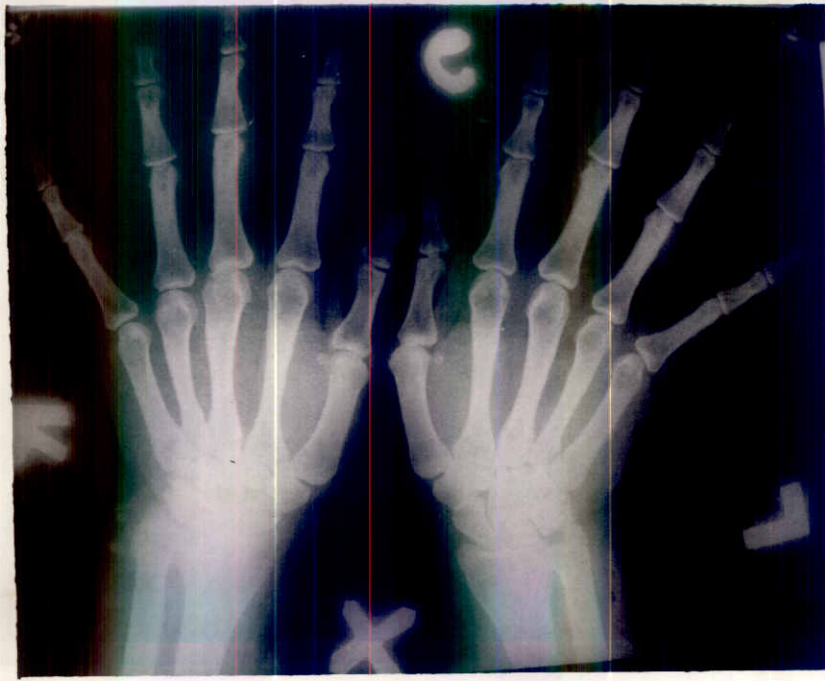


Fig. (10) Ulnar deviation of the fingers of the left hand.

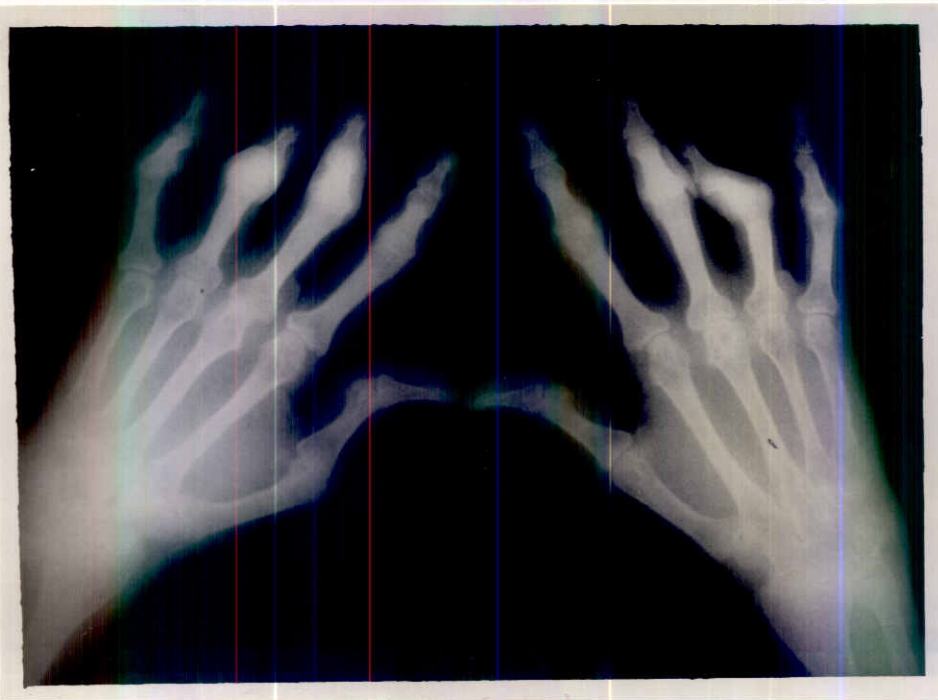


Fig. (11) Boutonniere deformity of ring finger of left hand and middle, ring and little fingers of the right hand.



*Fig. (12) Swan neck deformity.
(index, middle & ring fingers of left hand and index
& middle fingers of right hand.*